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HEADQUARTERS  
JOINT TASK FORCE SEVEN  
APO 187 (HOW) c/o PM  
San Francisco, Calif.

# 399

J-3/370.05

9 April 1954

SUBJECT: Reports on Evacuation of Natives and Surveys of Several  
Marshall Island Atolls  
RG 326 US ATOMIC ENERGY  
COMMISSION

TO: See Distribution

Location LANL  
Collection Records Center E-11 B-55  
Folder PACIFIC PROVINCE  
GROUNDS 1954-1955

1. Reference is made to letter this headquarters, J-3/729.3, subject:  
Radiological Surveys of Several Marshall Island Atolls, dated 18 March 1954  
(Secret, Restricted Data).

2. Attached herewith for your information and retention are copies of  
additional reports and memoranda pertaining to the above reference.

3. In addition to the above material, motion picture and still photo-  
graphy was accomplished on various phases of the initial pre-evacuation  
surveys and on the reception of natives at Kwajalein. Contact black and  
white prints of the still photography are being prepared as further material  
to document the native evacuation effort. These prints will not be of pro-  
fessional quality and will be forwarded primarily to indicate the over-all  
photographic coverage. Distribution will be made approximately 30 April  
1954, availability of prints permitting distribution to the following only:  
C/S USA (ExAgt), DMA (AEC), DEM (AEC), HICOMTERPACIS, CINCPAC, CINCPACFLT,  
CHAFSWP, COMNAVSTAKWAJ. Additional prints in specific sizes and quality,  
and motion picture coverage, may be procured in accordance with Annex T to  
CJTF SEVEN Operation Order 3-53. Particular attention is invited to para-  
graph 2b, Annex T covering Distribution and Control of photographic  
materials by the Atomic Energy Commission and the Department of Defense.

*P. W. Clarkson*

P. W. CLARKSON  
Major General, USA  
Commander

CLASSIFICATION CANCELLED  
BY AUTHORITY OF DOE/DOX

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USS RENSHAW (DDE-499) (1 cy)  
USS PHILIP (DDE-498) (1 cy)  
USS NICHOLAS (DDE-449) (1 cy)

9 Incls:

1. Report by CO USS PHILIP, Ser 001, subj: Evacuation of Rongelap and Ailinginae Atolls on 3 Mar 54, dtd 5 Mar 54.
2. Report by CO USS RENSHAW, Ser 038, subj: Report of Evacuation of Natives, Utirik Atoll, 4 Mar 54, dtd 18 Mar 1954.
3. Report by CO USS NICHOLAS, (and 1st Ind by CTG 7.3, Ser 0698 dtd 25 Mar 54), basic ltr ser 049, subj: Radsafe Survey 8-11 Mar 54, dtd 20 Mar 54.
4. Report by CO USS NICHOLAS, Ser 054, subj: Report of Rongelap Survey Trip, 25-26 Mar 54, dtd 28 Mar 54.
5. Memo for CJTF SEVEN, subj: DDE Trip to Rongelap Atoll 26 Mar 54, dtd 30 Mar 54.
6. M/R: Miscellaneous Radsafe Surveys of Rongerik.
7. M/R: Kwajalein NYOO Flight ABLE Results.
8. Drinking Water Samples (Analysis Report).
9. Soil Samples (Analysis Report).

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USS PHILIP (DDE 498)  
Care of Fleet Post Office  
San Francisco, California

DDE498:VLM:GWA:wk  
H2-1  
Serial: 001

5 Mar 1954

From: Commanding Officer  
To: Commander, Task Group 7.3

Subj: Evacuation of Rongelap and Ailinginae Atolls on 3 March 1954;  
report of

Ref: (a) COMTASKGROUP 7.3 Disp 020848Z of March 1954  
(b) COM JTF SEVEN Disp 021225Z of March 1954

Encl: (1) Passenger lists of evacuees from Rongelap and Ailinginae Atoll  
(2) Radiological statistics reported by monitor teams, Rongelap and Ailinginae Atolls  
(3) Location of water cisterns, Rongelap Island

1. In compliance with reference (a), the PHILIP got underway from Bikini at 2145M on 2 March and arrived and anchored off Rongelap Island in the lagoon at 0730M on 3 March. A PBM-5A (VP-29) aircraft, No. 2085, piloted by LCDR WELCH which previously had been dispatched from Kwajalein anchored about 100 yards off the beach of the same island shortly before the PHILIP anchored. Prior to anchoring, the PBM, in good radio communication with the PHILIP, made a thorough reconnaissance flight around the atoll. Also on departure the previous evening, the Commanding Officer of the PC 1546 offered much valuable navigational and general information which was of great help to the PHILIP.

2. The beach party including the Commanding Officer, Executive Officer, Radiological Safety Officer and a three man monitoring team proceeded from the PHILIP in a motor whale-boat to the PBM and picked up Mr. Marion WILDS, civilian representative of the Civil Administration Unit, Marshalls Trust Territories of Pacific Islands, and Oscar DeBrum, Marshallese interpreter. The beach was such as to allow an easy close-in landing without danger to the boat.

3. The party was met at the beach by John, the Magistrate of Rongelap. Monitoring of the island commenced immediately. On the basis of initial readings it appeared obvious that evacuation was definitely in order. The Commanding Officer, U.S.S. PHILIP presented Mr. Wilds with the general picture based on monitoring information, and on being informed that Commander Joint Task Force SEVEN had stated that the actual evacuation should be requested by trust territory officials, Mr. Wilds was very emphatic regarding the need for evacuation. Through the interpreter

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it was explained that it was to the best interests of the Rongelap people to leave the atoll and that the PHILIP was there for that purpose. Mr. Wilds was present during all the conversation with John the Magistrate and was of much assistance as also was LCDR V. L. MURTHA, Executive Officer of the PHILIP whose Majuro Island Government background proved very helpful in convincing the Marshallese that they should leave.

4. The information that the people would leave Rongelap was passed very quickly. Each person was asked to bring a small handbag as the only baggage since the monitors' readings indicated a high dosage on sleeping mats, palm baskets, and other personal belongings. It is considered very important that once the accepted leader is established and identified that all requests be made through him without exception. This procedure expedited the entire operation.

5. It was decided to utilize the PBK to transport the elderly and the sick to Kwajalein. John designated sixteen (16) persons and this party was embarked in the aircraft in about an hour and a half after the party first landed. These passengers are listed in Enclosure (1) which is forwarded herewith.

6. Fortunately, the Marshallese were not reluctant to leave the island. The magistrate explained that the people had been sick and he obviously deduced that all of the people would soon be provided the necessary medical care. John was apprehensive about the safety of his boat, a 30 foot sloop. The sloop was towed by the ship's whale boat to a better lee. Two anchors were dropped and the boat appeared to be in good holding ground.

7. The forty eight (48) remaining Marshallese were transported via two ship's whale boats to the PHILIP. Names of evacuees are listed in enclosure (1).

8. De-contamination of the Marshallese commenced immediately upon embarkation. Routes had been previously established and the de-contamination teams on station ready to guide the passengers to the de-contamination center (after crew's washroom). Clothing was placed in two G.I. cans aft and after a thorough shower clean clothes were readily available at the exit. The crew donated sufficient white and dungaree trousers, dungaree and "T" shirts without which the de-contamination could not have been as effective.

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9. Women and children were billeted in the torpedo room and the men provided temporary shelter under a canvas tarpaulin rigged on the 01 level between the stacks. Cots were available as seats in both locations. The after officer's head and washroom, a short distance from the torpedo room was designated for use by the women and children. The men had the use of the after crew's head and washroom. The separation of the Marshallese was mandatory due to the limited space available in the torpedo room. A continuous 24 hour sentry watch, all petty officers, was set at both locations to insure privacy and to assist in any requests made by the Marshallese.

10. All children were provided milk shortly after de-contamination. The Marshallese went through the regular mess line for meals and had the same ration as the crew. The meat course was the least popular. The majority of the party asked for more soup, bread and vegetables. Hot soup was most in demand. Ice cream was the natural favorite of all the children.

11. The contaminated clothing was washed in the ship's laundry with a strong soap solution, dried, pressed and returned within four hours after the party embarked.

12. Sleeping accommodations, although crowded, were considered adequate. Twelve (12) cots and two (2) stretchers were set up in the torpedo room and the remaining deck space covered with kapok life jackets. The men slept on the fantail under the deck awning. Life jackets proved to be comfortable pallets and are excellent insulation against warm or damp decks. With the above arrangements each person had a sleeping space.

13. The PBM plane Commander reported that he thought he saw some people on Eniaetok Island (Rongelap Atoll). A party, including John and Oscar DeBrum, the interpreter, landed on this island at 031245M. A thorough search was made but no Marshallese were located. The Magistrate insured the search party that he was certain that there were no persons there since a boat was not nearby. Monitor team readings indicated an average of 3.02 Roentgens, with a maximum reading of 3.65 Roentgens. Monitor team statistics are included in enclosure (2). It was lucky that this island was not inhabited.

14. Six (6) samples of water taken from wells on Rongelap have been forwarded in compliance with reference (b). Approximate locations of wells are indicated in enclosure (3).

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Serial: 001

5 Mar 1954

15. The ship then proceeded to Ailinginae Atoll. The Magistrate believed it possible that a party was on Enibuk Island. A party was landed, conducted a thorough search but found no one. The ship remained in the vicinity of Enibuk while the two whale boats proceeded to Sifo Island. A sloop was sighted anchored in the lagoon off Sifo Island. The party landed and John the Magistrate once again explained the need for leaving Rongelap. Eighteen (18) Marshallese were transported from this island. Both this group, and John, assured the party that there were no Marshallese on any of the other islands and the evacuation was considered completed. The sloop was anchored off the island in a good lee. The same procedures for handling the 18 evacuees from Sifo were followed as described in the preceding paragraphs.

16. The PHILIP departed from Ailinginae at 1800M on 3 March and arrived at the Naval Station Kwajalein at 0830M on 4 March. The Marshallese were disembarked during the morning of 4 March and removed to the Naval Dispensary. On arrival, the PHILIP was visited by Commander, Naval Station, Kwajalein, and representatives of Commander Joint Task Force SEVEN.

17. In spite of the willingness of the people to leave their homes there was understandable concern over the safety of the two sloops left behind at Rongelap and Sifo. These boats are a community asset for hauling copra and returning the basic food staples, medicines and clothing during the period that Trust Territory field trip ships are not available. There was a considerable amount of copra in a drying shed on Eniaetok and a smaller amount on Sifo. It was most disheartening to the Magistrate to leave the copra behind since he himself had prepared the copra on Eniaetok last week. All livestock, including about one hundred chickens and ten pigs were abandoned on Rongelap. Two dogs were also left on the island. Since the people were not given an estimate of the duration of their evacuation, the concern over the above items will no doubt increase as the absence from their homes grows longer.

18. It is recommended that aircraft periodically check the condition of the two sloops at Rongelap and Sifo. It is further recommended that some consideration be given to the transfer of livestock, copra and personal belongings on Rongelap, Sifo, Eniaetok. There is a possibility that these animals could be of much value for scientific research.

19. The Marshallese were excellent passengers, most cooperative, never demanding and exemplary in conduct. It was a distinct pleasure for the crew of the PHILIP to have been afforded the opportunity to assist these quiet people in the evacuation.

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CTU 7.3.1  
CTG 7.1

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G. W. ALBIN  
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A LIST OF MARSHALLESE EVACUATED VIA PBM FROM RONGELAP ISLAND  
ON 3 MARCH 1954

NAME	SEX	AGE
1. Loman	Male	66
2. Kanena	Male	75
3. Luiar	Female	83
4. Jelen	Male	70
5. Koma	Female	63
6. Tibaj	Male	28
7. Bekiri	Female	62
8. Jenet	Female	52
9. Betty	Female	6
10. Rinok	Female	17
11. Almira	Female	19
12. Ellin	Female	24
13. Luwetak	Female	78
14. Jabwe	Male	30
15. Antak	Male	48
16. Anjar	Female	59

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A LIST OF MARSHALLESE EMBARKED ABOARD THE USS PHILIP (DDE 498)  
FROM SIFO ISLAND ON 3 MARCH 1954

NAME	SEX	AGE
1. Jojea	Male	35
2. Baul	Male	2
3. Jaken	Male	42
4. Kotea	Male	4
5. Janoor	Male	57
6. Torty	Female	55
7. Apea	Female	13
8. Jonbok	Female	10
9. Jabkeon	Female	1
10. Kaban	Female	19
11. Bolking	Female	2
12. Biliem	Female	12
13. Nameko	Female	16
14. John	Female	2
15. Kety	Female	16
16. Lija	Female	37
17. Amon	Female	25
18. Kajim	Female	35

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RAD SAFE REPORT

(Evacuation and Decontamination of Marshallese Natives)

I. Data:

	: READINGS (in MR/HR):				: Time of : : Readings :
	: Island :	: Ave. :	: Max. :	: Inhabited :	
: Rongelap :	: 1473 :	: 1900 :	: Yes :	: 031045M :	
: Eniaetok :	: 3035 :	: 3650 :	: No :	: 031245M :	
: Enibuk :	: 445 :	: 550 :	: No :	: 031545M :	
: Sifo :	: 412 :	: 480 :	: Yes :	: 031715M :	
Totals	: 4 :	: - - - - - :	: 2 :	: - - - - - :	

II. DECONTAMINATION: (PERSONNEL)

1. Decontamination readings are as follows:

Average Readings

: ISLAND :	: Before :	: After :
: Decontamination:	: Decontamination:	: Decontamination :
: Rongelap :	: 60 MR/HR :	: 25 MR/HR :
: Sifo :	: 40 MR/HR :	: 15 MR/HR :

NOTE #1. Clothing was slightly contaminated even after decontaminating procedures were employed due to its rough surface and prolonged exposure to radiation. However, maximum readings of less than 50 MR/HR did not warrant discarding women's clothing due to the short time it was to be worn.

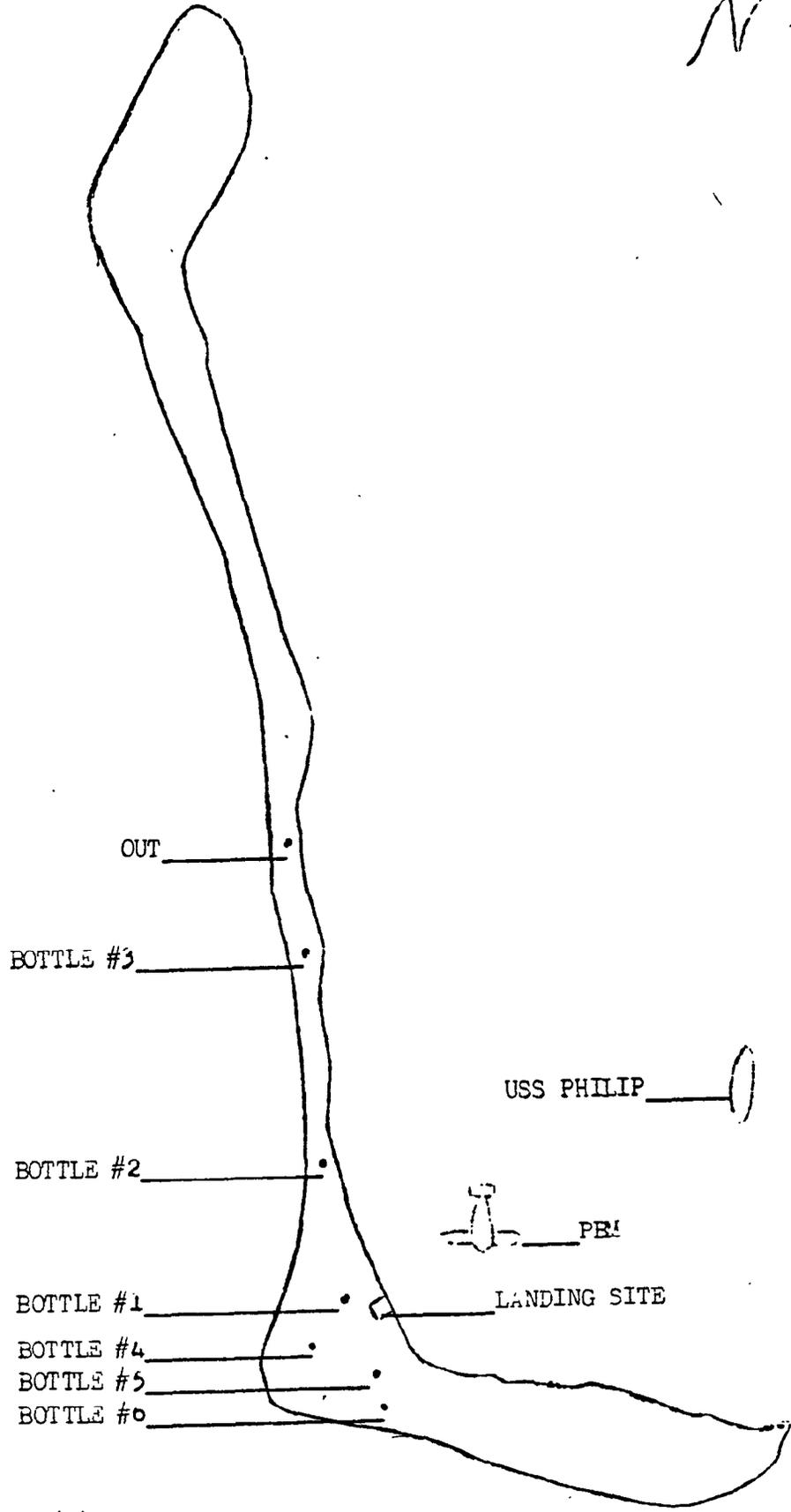
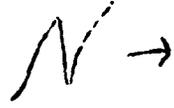
NOTE #2. Decontamination upon leaving the ship: 20-22 MR/HR.

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Enclosure (2)

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LOCATION OF WELLS SAMPLED 3 MARCH 1954, RONGELAP ISLAND.



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Enclosure (3)

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USS RENSHAW (DDE-499)  
Fleet Post Office  
San Francisco, California

In Reply Refer to  
DDE499/LHA:rec  
A9  
Serial: 038  
18 March 1954

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From: Commanding Officer, U.S.S. RENSHAW (DDE-499)  
To: Commander Task Group SEVEN POINT THREE

Subj: Report of Evacuation of Natives, Utirik Atoll, 4 March 1954

Ref: (a) CTG 7.3 conf disp 031220Z  
(b) CTG 7.3 conf disp 032040Z

Encl: (1) Informal Narrative of Evacuation of Utirik Island Natives

1. In accordance with reference (b), enclosure (1) is submitted herewith.
2. A limited number of photographs were taken of some phases of the evacuation by the ship's official photographer. These are not being processed and it is later planned to submit prints as a supplement to this report.
3. The four drinking water samples mentioned in enclosure (1) as obtained from the regular living area, Utirik, were delivered to CJTF 7 on 8 March 1954 via Major R. D. Crea, USA, Staff CJTF 7.

/s/  
L. H. ALFORD

Copy to:  
CTU 7.3.1

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ENCLOSURE (2)

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Enclosure (2)  
to CTG 7.3 ltr  
Serial 0691

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INFORMAL NARRATIVE OF EVACUATION OF NATIVES FROM  
UTIRIK ATOLL, MARSHALL ISLANDS

Having received orders at just before dawn on 3 March 1954, to proceed to Utirik Atoll, the Renshaw, immediately departed from the patrol area north of Eniwetok Atoll and set course eastward to pass south of Bikini enroute. Speed was adjusted to arrive at daylight the next day and the 400 mile voyage was completed without incident.

Meanwhile, new activity was evident in Renshaw. Charts, sailing directions, tide tables and all possible sources of information on the Atoll were searched and avidly studied. Although the decision that the natives would be evacuated was not known on board until late in the night of the 3rd, plans were firmed up for handling the people. Several schemes were put forward but the final plan was made with the invaluable knowledge and assistance of E. K. Tryba, BMC, USN. He had served a tour of duty in trust territories west of the Marshalls and had experience in evacuation of natives.

Although the Douglas A. Munro (DE-422) was detailed to assist Renshaw, her estimated arrival was not until 041330M, hence plans were made for the possibility of receiving on board Renshaw all the reported 180 natives of the Atoll.

The approach to the target Atoll was made from the westward and north of Taka Atoll which is only 4 miles SW of Utirik. It was sighted at about 0630M on the morning of 4 March and course was set southeastward to pass between the two atolls. Enroute to the south side of triangular shaped Utirik Atoll, we passed close to the reef on the western side in order to get a look at Utirik Passage. There was no thought of entering this channel inasmuch as Sailing Directions were very definite that no ship larger than a PC should make the attempt. Nevertheless, a look was desired to determine if charted beacons were present (they weren't) and to determine the feasibility of our boats entering the lagoon or perhaps even the DE should it be found too dangerous on the south side for the evacuation. Theoretically, it would have even been possible for Renshaw to enter at high tide about 1600M when our 18 ft. drag aft would clear the channel about 3 ft. if the charted depths were correct and if the sun at our backs made the channel and coral heads visible. It was reckoned that the thrill of entering this channel for the C.O. would be about like that of Russian roulette.

Upon rounding the SW tip of the Atoll, course was set eastward to skirt the reef along the southern leg which appeared to offer the best lee from wind and surf for the evacuation. Fortunately the weather was exceptionally good with light NE winds and only moderate swells. At 0735M the ship hove to at about 500 yds just south of Utirik Is., the largest of the Atoll and on which all the natives were reported to live. At this time trust territory officials and interpreters had not arrived nor had an ETA been received. In view of our directive to commence evacuation at daylight it was decided

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ENCLOSURE (1)

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to proceed at once as best we could until the trust officials arrived or if necessary without them. It was hoped that we might find a missionary, a pidgin English native or even a trust representative ashore.

Consequently at about 0740 the gig (26 ft. MCB) was launched and a beach party was embarked with the Executive Officer, LCDR V. H. Easton, USN, in charge. He was to try to get ashore as soon as possible, organize the natives for evacuation and determine the best location and means for the evacuation. Included in this party were the Radsafe Officer, monitor, hospitalman, signalman, etc. As soon as this party shoved off, a second MCB was launched with the Gunnery Officer in charge, who was to search along the reef for a break or a more favorable spot for safe boat handling in the evacuation.

Now, as the boats left the ship, we commenced execution of our plans for receiving the natives on board. Awnings were rigged on the fantail with side strips from the deck to the redge ropes. Additional life lines were rigged for the safety of children. Fore and aft and vertical accesses to the fantail were closed or roped off and awnings rigged where necessary to ensure privacy for the natives. The entire crew's washroom and head aft (largest on board) were set aside for the natives and for their decontamination inasmuch as this is the ship's main station for this purpose. An outside salt water shower was rigged, a receptacle was provided for their clothes and sufficient clean dungaree shirts, trousers, etc., were raised by an appeal to the crew, to thus clothe all the natives. A pig-pen was fashioned by closing off access to a 3" gun tub. We planned to tether chickens to life lines on the 01 deck and let the dogs roam free amongst the populace.

Meanwhile, the Executive Officer and party approached the south shore of the island at a point about 1500 yds west of the eastern tip. The island here and elsewhere has a continuous outer perimeter of table reefs extending some 40 yds out into the water over which the waves produced a surf of medium size and presented considerable small boat hazard. Having selected a point where the surf was slight and appeared to offer the best spot, the Executive Officer commenced paddling ashore in a small, one-man rubber raft (we kept it after picking up a bailed-out jet pilot last fall), which had a line attached to it from the boat. After some progress towards the beach he appeared to experience difficulty with the surf and some unseen force resulting in no progress. Considerable humor and some concern were evoked at sight of the Executive Officer furiously paddling, each stroke whirling the raft 180° around but making no progress. It was later determined that the line from boat to the raft had fouled in the coral, securely anchoring him to seaward. By this time a few of the natives had appeared and some of them swam out and helped him ashore amidst friendly greetings.

At about this time, Navy JRF 912 seaplane arrived from Kwajalein, landed in the western part of the lagoon and commenced taxiing eastward towards

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Utirik Is. After establishing radio communications with the plane and ascertaining the number of passengers, the Executive Officer was directed to cross over to the lagoon side and use the rubber raft or any means to land the plane passengers. With the friendly help of the cooperative natives, the X.O. with the rubber raft, set out in an outrigger canoe towards the seaplane in the lagoon. But just as he approached the plane it taxied away apparently not distinguishing him among the natives. It had been suggested to the plane that if he had difficulty landing passengers in the lagoon, he might try landing outside the lagoon near the ship. Upon hearing this suggestion, the plane took off immediately and after one try, a tremendous bounce, another circle and approach, landed near the ship about 0915M.

Meanwhile, the gig having disembarked the Executive Officer was instructed by him to proceed eastward about 500 yards to a small cove where the natives said landings could be made with more ease and safety. This was done but calling it a cove is a misuse of the term. Ease and safety did not seem to fit the situation either but it did appear less dangerous. By using the anchor to seaward the gig was slowly worked up to the reef edge where the Radsafe Officer and his team disembarked and waded ashore to the same friendly welcome, handshakes and "Good Morning" from every native, large and small. During this time the Executive Officer had returned to the beach from the lagoon and his try at receiving the plane passengers and advised the native chief to prepare his people for evacuation. Some of the natives who seemed to understand and spoke some broken English were of great assistance in this. At this time the ship was advised by the X.O. of the necessity for evacuation on southern and seaward side of Utirik Island and that native boats would be of no practical assistance. The Gunnery Officer in the MNB, after searching for several miles along the south leg of the atoll, reported there were no breaks in the reef nor landing places of any kind.

After the gig had disembarked the remainder of the beach party, it was returned to the ship having lost its anchor in leaving the reef. It arrived in the vicinity of the ship just in time to meet the plane and take aboard its passengers. They consisted of Marshall Island Trust Territory representative, Marshall Island interpreter, and two public relations civilians attached to staff, CJTF 7. After a brief consultation on board and procurement of another boat anchor, the gig was again dispatched to the beach, meeting the MNB enroute and receiving from it a radioman with a portable SCR-300 radio which greatly facilitated the operation. This party was met by the Executive Officer and the group then set out for the village. The seaplane departed shortly for Kwajalein.

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ENCLOSURE (1)

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While this was going on the Radsafe Officer and his team were making their survey with radiac instruments AN/PDR-27E. The first readings taken were on the seaward side of the island where intensities of 110 mr (with and without beta shield) were found. Readings of 120-130 mr (with and without shield) were indicated along the foot path connecting the seaward side of the island to the village on the lagoon side. Upon arrival at the village, several natives were monitored with the following readings common to all; over all body 100 mr (with and without shield), hands 100 mr (with and without shield), gonads 105 mr with shield and 110 mr without shield, feet 115 mr with shield and 120 mr without shield. Since the readings in the air over the entire middle section of the island was 100 mr, it is believed that the 100 mr readings stated in this report were due to background intensity effects.

Other items monitored in the village and their intensities were; thatched roofs 125 mr with shield, 130 mr without shield, 4 water samples from wells 100 mr with and without shield, all food with exception of coconuts 100 mr with and without shield, coconuts in their various forms of preparation ranged from 130-150 without shield, fish cleaning table 124 mr with shield, 130 mr without shield. A short field trip was made into the undergrowth and grass areas surrounding the village where readings of 160 mr with shield, 170 mr without shield, were found close to the ground, indicating concentrated and trapped contaminating particles. The monitor made his way via projecting coral pieces some 10 yards into the lagoon where the water gave a 50 mr reading with and without the shield. The hospitalman was assigned the task of collecting water samples and succeeded in obtaining 4 samples of drinking water from 4 of the most commonly used cistern reservoirs in the village. It is believed that the very low contamination of the water was due to the roofs over each reservoir.

Upon arriving at the village the Executive Officer with Trust Territory official again informed the natives through the interpreter of the necessity for evacuation. The interpreter was asked not to scare the natives or unduly rush them. Nevertheless, he had the floor and after a few words, the natives really moved though it is not believed he shook them up too badly. It was carefully explained that we would take along their pigs, chickens, dogs, boats or anything we could load. But after a conference with the Trust official in which the degree of contamination, decay and ultimate return of the natives were discussed, it was decided, on recommendation of the official, to leave the livestock and boats behind. The natives agreed to this and after being reassured that their possessions and animals would be safe until their return, began streaming toward the evacuation beach. Possessions taken along rarely exceeded two bundles each, and one of which was usually a woven bedding mat.

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At this time, about 1015M, the ship was advised by the X.O. that the evacuation would commence about 1100 and a life raft was requested for use in shuttling the natives over the reef and through the surf to the boats standing off about 50 yards. At approximately 1040M the boat arrived with the raft and the evacuation commenced at 1050. By this time the majority of the natives were gathered on the beach and ready to go. Women, children and old people were shuttled out to the boats first, with their possessions, followed by the men. Much cooperation and assistance were realized from the able native men whose alertness, willingness and ability to swim proved invaluable during the evacuation and reduced the number of ship's personnel required. At about 1200 the evacuation was about half completed but the wind was freshening, the tide was flooding and the surf was kicking up. The operation became increasingly hazardous and two raft loads of evacuees were very nearly upset in the surf. The coral was chewing up the suspension ropes and lattice work of the raft and in a radio consultation between the X.O. and C.O., serious consideration was given to ceasing the operation and trying again from the lagoon side. Since this would delay the operation several hours and also was fraught with danger as already indicated, and since we could see the end in sight, it was decided to continue. Most of the women, children and aged were already gone and no one had been hurt other than a few coral cuts. Another raft was dispatched and the pace was stepped up, though less people were loaded on each raft and extreme care was exercised.

Ten MVB loads of about 15 people each were required to complete the evacuation of the 154 natives. The last raft load left the beach at about 1245M leaving as forlorn a set of dogs as you have ever seen. At 1251M all the natives were on board and none too soon because the wind and surf continued to increase. The native chief named Compass, has been repeatedly asked how many natives were on the atoll and if we had them all. He was insistent that all were on Utirik Island, none were on other islands of the atoll, and none were on Taka Atoll, 4 - 5 miles away. He first said there were 161 natives present and proudly brought out a card index file to prove it. Careful questioning however indicated that at least two infants had died a day or two before and that the old boy didn't have this PALL records up to date. The next figure we got was 157 but further questioning indicated he was counting two or three imminent but as yet unborn babies. The last figure of 154 was arrived at after a count on board and was concurred in by the chief and Trust official. A breakdown was as follows: men 47, women 55, children under 16, boys and girls, 26 each.

At about 1300M when rafts were secured and boats were hoisted, course was set for Kwajalein to arrive at dawn on the 5th. At about 1345M we met the D.A. Munro (DE-422) coming up from Kwajalein to assist us but there was nothing further for her to do but fall in astern and return to Kwajalein.

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ENCLOSURE (1)

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It did not seem prudent to further move the natives around by dividing them up between the two ships, inasmuch as no great overcrowding was evident. The Munro had a medical officer on board and offered his services which fortunately were not needed. It was comforting to know he was available however, should any of the pregnant women fall due and payable while on board.

Reception and handling of the natives on board worked out fairly well and generally as was expected. Each one was monitored as they came on board and readings were around 7 mr/hr which was substantially lower than the average of 20 mr/hr readings on the beach. This indicated that wading out to the rafts had helped quite a bit in reducing presence of fall-out material on feet and clothing. Some of the children were routed through the showers as soon as they came on board. But it was decided to feed all of them before starting decontamination of adults. Serving lines were set up on the fantail using regular steam table trays of food and giving the natives paper plates, cups, etc. They didn't eat very well, perhaps from the excitement or maybe they just don't like meat loaf. They did better on the bread, mashed potatoes and oranges.

After lunch the Trust Territory official made some suggestions for changing and improving our facilities which included careful partitioning and segregation of the women's side of the head and washrooms. He explained that under conditions of excitement and strange surroundings the women are extremely modest. Then commenced decontamination measures and considerable resistance was encountered. But by prodding and cajoling we managed to get all about 10% of them through the showers. These were the aged, infirm and sick. With no readings higher than 7 mr/hr it was decided not prudent to force the old people in the showers. Next the problem of clothing arose. We had sufficient clean dungarees for them all and planned to run all their clothes through the laundry and give them back to put on before leaving the ship. But here again stiff resistance was encountered. We tried but they couldn't seem to understand taking their clothes away and the women wanted no part of the dungarees. Clothes were monitored and since they averaged only about 3-4 mr/hr it was decided that the situation did not call for such drastic measures. All of these matters were discussed with the Trust Territory official, and decisions were concurred in or made on his recommendations. Careful observation of the natives and questioning of the interpreter as to their mood, excitement and general morale convinced us that forcing them to give up their clothes would really shake them up.

By late afternoon they were settled down on their mats and generally quiet except for the kids, some of whom took several showers. They were bright-eyed and cute as could be. Some few of the women, as is their wont, talked quietly but steadily all afternoon from the time they came aboard.

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We fixed up a fine supper for them of boiled fish and rice with tomatoes and lima beans mixed in. By this time they had gotten used to their surroundings, had recovered their composure and their appetites. They really stowed away the chow. This was followed by ice cream and cookies, heavily sweetened grape ade and some bright colored hard candy we had left over from last Christmas. The men were given cigarettes and all seemed contented and happy. Finally, we showed them a movie and there was not the slightest reaction of any kind from any of them the whole time. It should be remembered that most of these natives had never been off the atoll and as far as is known had never seen a movie.

The night was passed without incident and they seemed to rest well on their straw mats. The weather continued good and since we were proceeding downwind at a speed of only 11 knots there was practically no motion of the ship. Next morning they ate and seemed to enjoy a big breakfast of hot cakes, bacon, bread and jam. After considerable rubber necking as we entered Kwajalein harbor and during the process of mooring to the pier, the natives were disembarked at about 050900M to waiting buses in custody of ComNavStaKwaj. As they went over the side one could not help but observe and admire the innate dignity of these simple human beings and their naive but forthright and optimistic attitude towards life. These seemed to be expressed in a conversation with the native chief through the interpreter. The chief was asked what they had seen and he replied with gestures indicating a large explosion. He was then asked what they thought of it and his reply was not the negative one as might be expected that the world was coming to an end, but, "The world, we think she start over again."

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ENCLOSURE (1)

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JOINT TASK FORCE SEVEN  
TASK GROUP 7.3  
APO 187 (HOW), c/o Postmaster  
San Francisco, California

FF3/7.3/10:jmt  
A16-10  
Ser: 0698  
25 Mar 1954

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FIRST ENDORSEMENT ON USS NICHOLAS (DDE-449) ltr P-22 ser 049 of 20 Mar 54

From: Commander, Task Group 7.3  
To: Commander in Chief, Pacific  
Via: Commander, Joint Task Force SEVEN

Subj: RadSafe Survey 8-11 March 1954

1. Forwarded as a matter of information.
2. The recommendations of the Commanding Officer, USS NICHOLAS (DDE-449), will be considered carefully if additional surveys of this type are required.

H. C. BRUTON

Copy to:  
CTG 7.1  
COMCORDES DIV 12 (without basic)  
USS NICHOLAS (DDE-449) (without basic)

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INCLOSURE (3)

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USS NICHOLAS (DDE-449)  
Fleet Post Office  
San Francisco, California

DDE449/mw  
P-22  
Ser: 049  
20 Mar 54

From: Commanding Officer  
To: Commander Task Group 7.3

Subj: Radsafe Survey 8-11 March 1954

1. The Task Group 7.1 survey party and Mr. Marion Wilds, trust Territory representative, arrived Rongelap at 0745M, 8 March and boarded NICHOLAS shortly thereafter. Working parties, as indicated in Commander Joint Task Force SEVEN dispatch 060400Z, were made available to Dr. Scoville's party. Dr. Scoville informed the Commanding Officer that all reports of gamma intensities and other scientific data would be reported only to Commander Joint Task Force SEVEN. He specifically requested that no other commands be made information addressee. Daily dispatches indicating results of RadSafe survey on each atoll, originated by Dr. Scoville, were addressed accordingly. On debarking at Eniwetok at 0830, 12 March Dr. Scoville's party transported all earth and water samples to Parry Island.

2. The following islands, in atolls, were visited. Mr. Wilds accompanied working parties ashore on all ex-inhabitated islands where native property was secured as directed by him.

a. Rongelap Atoll; 8 and 11 March 1954:

(1) Rongelap Island:

(a) Native houses were closed up and property left in the open, that could be ruined by weather, was moved inside.

(b) One dog and three cats were killed as possible menace to livestock.

(c) One thirty foot sailing schooner was beached above high water mark and filled with sea water. Masts were unshipped and placed in a shed along with sails.

(d) Two sacks of rice and five sacks of flour were opened and placed outside as feed for pigs and chickens.

(e) Buckets, pans and large clam shells were placed under eaves of houses to provide drinking water for livestock.

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(f) All livestock appeared to be in good condition. It is believed that sufficient water will be available although a shortage of food is expected to develop in the near future.

(g) Water and soil samples were taken as directed by Task Group 7.1 personnel and intensity levels were taken.

(2) The islands listed in sub-paragraph (3) through (15) are all uninhabited except for parties of natives that go from Rongelap to make copra, collect sea birds and fish. There was no native property found. Intensity levels were taken by Task Group 7.1 personnel.

(3) Eniran Island.

(4) Arbar Island.

(5) Busch Island.

(6) Enialo Island.

(7) Enisetok Island.

(8) Anidjet Island.

(9) Kabelle Island.

(10) Eriirippu Island.

(11) Lukuen Island.

(12) Gejen Island.

(13) Lomumilal Island.

(14) Merik Island.

(15) Eken Island.

b. Utirik Atoll; 9 March 1954

(1) Itirik Island:

(a) Three canoes were beached above high water mark.

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(b) Houses were closed up against weather and property left in the weather, that could be spoiled, was moved inside.

(c) Water catchments were provided for livestock by placing old pans, buckets and large clam shells under eaves of houses.

(d) Six dogs were killed to protect livestock.

(e) All livestock appeared to be in good condition.

(f) Water and soil samples were obtained and intensity levels taken.

(2) Aon Island:

(a) Uninhabited - intensity levels taken.

c. Bikar Atoll; 9 March 1954

(1) Bikar Island:

(a) Uninhabited - intensity levels taken.

d. Rongerik Atoll; 10 March 1954

(1) Eniwetak Island:

(a) Air Force personnel were landed along with a ship's working party. Spoiled meat and other consumables were dumped in the sea. Equipment was tested and secured against the weather as directed by Air Force personnel.

(b) Water and soil samples were obtained and intensity levels taken.

(2) The islands listed in sub-paragraph (3) through (6) are uninhabited. Intensity levels, only, were taken.

(3) Rongerik Island.

(4) Mortlock Island.

(5) Latoback Island.

(6) Bock Island.

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e. Alinginae Atoll; 10 March 1954

(1) Sifo Island:

(a) Native property, left by people who were visiting from Rongelap Island, was protected against the weather. All clothing, tools, etc. were placed inside a canvas shelter on top of dried palm fronds, and covered with additional canvas.

(b) A thirty foot sailing schooner was moved to a safe anchorage in the lee of Eniuetakku Island. The boat was anchored in a sandy spot in the event that it should sink. Beaching was impracticable due to the limited time available.

(2) Enibuk Island:

(a) Native property secured, intensity levels taken.

(3) Bokonikairu Island:

(a) Uninhabited - intensity levels taken.

3. Navigation and general information:

a. Rongelap Atoll:

(1) Entrance can be made quite readily through South Pass and North east Pass. West Pass shows quite plainly, however, no passage was attempted because soundings are not adequate. Navigational fixes, using tangents were good. The Small Boat Passage in the Northwest part of the atoll is difficult to see and appears to be very dangerous when heavy swells are running.

(2) Landings can be readily made on all islands by motor whaleboat. On most of the islands the beach gradient was quite steep, permitting easy beaching of boats. A sharp lookout should be maintained at all times for coral heads and dark, yellow, or dark green, water should be avoided.

b. Bikar Atoll:

(1) Bikar Island Passage is very difficult to find and passage through the lagoon is difficult even for a small boat. A landing was made with very little difficulty in the lee of Bikar Island at low tide. It was found advisable to put the bow of the boat against the reef, which rises steeply at low tide, and let the party wade ashore. The water is only knee deep at this period of the tide. Backwash from the reef should be carefully watched.

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(2) The island and surrounding water teems with fish, turtles and sea birds.

c. Rongerik Atoll:

(1) The ship did not attempt passage into the atoll because of the poor navigational aids available. It is believed that a shallow draft vessel should experience very little difficulty in making passage.

(2) Small Boating is rough, but not dangerous. Extreme care should be exercised when approaching Bock Island as many coral heads are present and the water is very shallow.

d. Ailinginae Atoll:

(1) Only small boat entry was made. A shallow draft vessel should have very little difficulty making entry. Navigational cuts were very poor.

(2) Small boating was rough but not dangerous.

e. Utirik Atoll:

(1) The four beacons shown on HO chart 6023 have been replaced by two black buoys. It is understood that the Trust Territory AKL makes regular entry into Utirik Atoll through Utirik Passage. The beacons on and around Utirik Island are missing.

(2) Small boating is not difficult, but a sharp watch should be maintained for coral heads.

4. Recommendations and Summary:

a. Survey of these atolls from a DDE type vessel is somewhat inefficient in that Rongelap is the only atoll, of the five visited, that can be entered and navigated safely, thus limiting the number of islands that can be covered in a given time. Boat handling operations outside the atolls were difficult due to heavy swells. With the forces available, it is believed that the use of a DDE is the most practicable solution for similar missions. For operations subsequent to "CASTLE", it is recommended that a smaller class ship of shallow draft be used. This would permit entry into most lagoons shortening boat runs, in some cases twenty miles.

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- b. Make boat entry into windward part of lagoon wherever possible. This permits boats to run down wind, speeding the operation and helping to keep instruments dry.
- c. Maintain radio communication with boats. In this respect, this command used SCR 536 which were the only battery type radios available. Communications were fair. It is recommended that an SCR 608 or similar small battery radio with at least a thirty mile range be used if possible.
- d. It was found advisable to provide the boats with overlays of the atolls showing magnetic compass courses between islands and passes.
- e. Provide boats with food, water, binoculars and rifles. The last for protection against sharks in case a man falls over board.
- f. Use stern anchor when beaching to prevent broaching. Do not let boat remain on beach, but haul out and await return of party.
- g. Beach in the lee of island whenever possible.
- h. It was found impossible to cover all of the islands in each atoll in the time allotted. Rough weather and long boat runs between islands in atolls slowed up operations. Task Group 7.1 scientific personnel designated the islands they desired to survey and landings were made on all so designated.
- i. Working parties were kept firmly in hand. Each working party was required to remain in sight of a commissioned officer and Mr. Wilds. As far as could be determined, no native property was molested or pilfered.
- j. It is estimated that the maximum accumulative dosage received by any one person in the parties was 2.5R. Film badges, worn by all personnel ashore, or in the boats, have been forwarded to the U.S.S. BAIROKO for developing.

/s/J. C. ELIOT  
J. C. ELIOT

Copy to:  
COMCORTDES DIV 12

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U. S. S. NICHOLAS (DDE-449)  
c/o Fleet Post Office  
San Francisco, California

DDE449/mw  
P22  
Ser: 054  
28 March 1954

~~CONFIDENTIAL~~

From: Commanding Officer  
To: Commander Task Group 7.3

Subj: Rongelap Survey Trip 25 - 26 March 1954; report of

1. The USS NICHOLAS (DDE-449) departed BIKINI Atoll at 1900M, 25 March 1954 for RONGELAP Atoll in accordance with Commander Joint Task Force SEVEN 231131Z and Commander Task Group 7.3 232323Z of March 1954. The following personnel from Task Group 7.1 were on board:

Dr. Lauren R. Donaldson  
Dr. Thomas L. Shipman  
Dr. Edward E. Held  
Dr. Ralph F. Palumbo  
Dr. Paul R. Olson  
Dr. Thomas N. White  
Mr. William W. Robbins  
Mr. Pasquale R. Schiavone  
Major Charles M. Barnes, USAF

2. The ship arrived off the South Entrance, RONGELAP Atoll at 260100M and put a whale boat in the water at 260630M to meet the plane arriving from Kwajalein with Dr. Bond's party.

3. The ship then proceeded to Northeast Pass, RONGELAP Atoll, entered and anchored. Dr. Donaldson and his party departed the ship at 0830M.

4. The plane from Kwajalein arrived off RONGELAP at 0905M, was met by the whaleboat. Dr. Bond, Mr. Marion Wilds, three Public Health Service Officers, three Natives and miscellaneous equipment was transported to the beach. The plane was guided to an anchorage about two hundred (200) yards off shore from the village where it was anchored.

a. Personnel from the NICHOLAS assisted Dr. Bond to accomplish the following: Capture five young pigs and one sow; capture five chickens; obtain soil, fruit and vegetation samples. One boar was killed and an autopsy was performed on the spot. The animals and other samples were placed in cages and transported to the plane. Dr. Bonds party departed RONGELAP at 1300M, 26 March 1954. The whaleboat then departed RONGELAP Island and proceeded north to rejoin the ship, stopping at BUSCH and ENIAETOK Island to measure radioactive intensity. One member of RadSurvey Team accompanied this boat to conduct RadSurvey on Southeastern Islands. Dr. Donaldson's party worked in the Northeast part of RONGELAP Atoll, collecting fish, soil, birds, invertebrates, algae and vegetation samples. One member of RadSurvey Team accompanied this party to conduct RadSurvey of Northern Islands. It was not possible to collect rats, as desired, due to the unexpected departure of the ship as directed by Commander Task Group 7.3 260217Z of March 1954.

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DDE449/mw  
P22  
23 Mar 1954

5. Dr. Bond expressed the opinion that his mission had been accomplished to his satisfaction. Dr. Donaldson stated that his mission has been accomplished satisfactorily. Mr. Marion Wilds, Trust Territory Representative requested that the boat at ALINGANIE be beached whenever practicable. All boats at RONGELAP have been beached by NICHOLAS.
6. Prior to the ships departure, three RT-176/PRC10 radios were obtained by Mr. P. Schiavone from Task Unit 7.1. These radios were very satisfactory and far superior to the BC-611-F used on the last trip. It is recommended that this type radio be used by ships on future trips if they are required to operate small boats a long distance from the ship. Reception was excellent at twenty (20) miles.
7. The ships departure from RONGELAP Atoll was delayed until 262130M because the motor whaleboat experienced a fuel pump failure on returning from KABELLE Island, where they were collecting rat traps.
8. The ship rejoined Task Group 7.3 off BIKINI Atoll at 270130M.

J. C. ELIOT

Copy to:  
COMJOINTASKFORCE SEVEN  
COMCORDESDIV TWELVE

[REDACTED]

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30 March 1954

MEMORANDUM FOR: CJTF SEVEN

SUBJECT: DDE Trip to Rongelap Atoll, 26 March 1954

1. Reference JTF SEVEN DTG 230220Z March 1954. Purpose of subject trip, conducted by USS NICHOLAS (DDE 449) was to:

- a. Beach small boats belonging to Rongelap Marshallese.
- b. Conduct radsafe re-survey of Rongelap.
- c. Collect approximately 500 pounds contaminated top soil requested by AEC Division of Biology and Medicine.
- d. Collect samples of Marine life and vegetation.
- e. Collect domestic animals remaining at Rongelap village.

2. The undersigned acted as JTF SEVEN and TG 7.1 representative and was responsible for execution of lb and lc. Since the NICHOLAS will make an overall report, and detailed reports on ld and le will be made by the project officers concerned, the details in this report are confined to lb and lc.

3. It is noted that the scope of activities lb and ld was more limited than had originally been planned. As will be clear from the report of the NICHOLAS, this was because 26 March became R-1 after the work started. Thanks mainly to the excellent planning and management of Capt. Joseph Eliot and Executive Officer Clifford Frink, much more was accomplished than might reasonably have been expected under these circumstances. lc and le were accomplished essentially as planned, but la had to be omitted.

4. The radsafe re-survey was conducted by Mr. P.R. Schiavone of TG 7.1, TU-7, using two recently calibrated AN/PDR-39 instruments. Readings on Rongelap Island were taken during the morning and on the other islands during the afternoon of 26 March.

<u>Island</u>	<u>mr/hr</u>
Rongelap	40 at 0830 at standard position established by Scoville Survey
Boseh	50 South end
Eniaetok	90
Labardj	200
Kabelle	500

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ENCLOSURE (5)

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On Rongelap Island, the readings in the huts appeared to be 10%-15% less than outside. Inside the huts the readings at ground level were about 70% of those at head level. Readings over gravel areas and near the cisterns were about 30 mr/hr; inside the cisterns, about 10-15 mr/hr.

5. The top soil sample was obtained from LABARDJ Island a small island well covered with bushes and grass, but without palm trees. It had been planned to get the sample from KABELLE, but this could not be done without interfering with the fish and vegetation collection.

6. Special mention should be made of the work of Mr. P.R. Schiavone, who did an excellent job of getting supplies and equipment not available on the NICHOLAS, as well as conducting the rad-safe survey.

s/ T. White  
t/ T. WHITE  
H Division, LASL

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MEMORANDUM FOR RECORD:

SUBJECT: Miscellaneous Radsafe Surveys of Rongerik (Surveys conducted by CTG 7.4)

RONGERIK

17 March, 1200 MIKE

Living Area Readings:

Mess hall interior	40 - 100 mr/hr	Waist level
Hospital interior	50 - 75 mr/hr	Waist level
Walk from hospital to mess	100 - 110 mr/hr	Waist level
Store room (behind mess)	50 - 55 mr/hr	Waist level
Exterior store room tent	100 - 150 mr/hr	Waist level
General Area exterior	100 - 150 mr/hr	Waist level

Weather Station Site Readings:

Exterior areas local	125 - 150 - 160 mr/hr	Waist level
Interior all tents	50 - 75 mr/hr	Waist level
Interior building	50 - 60 mr/hr	Waist level

Army Site Readings:

General area	140 - 190 mr/hr	Waist level
Interior tents	70 - 80 mr/hr	Waist level
Adjacent to trailer	160 - 180 mr/hr	Waist level

19 March, 1100 - 1220 MIKE

Landing on beach	42 mr/hr	Waist level
Living area	60 mr/hr	Waist level
Inside mess hall	22 mr/hr	Waist level
Inside dispensary	26 mr/hr	Waist level
Inside barracks	23 mr/hr	Waist level
ESE end of island (Rawinsonde)	47 mr/hr	Waist level
Along road to Rawinsonde area	40 - 42 - 40 mr/hr	Waist level
Inside weather building	23 mr/hr	Waist level
Work area outside building	60 mr/hr	Waist level
Army area (around trailer)	40 mr/hr	Waist level
Inside foilage area	40 mr/hr	Waist level
Inside tent	19 mr/hr	Waist level

19 March, 1400 MIKE

Inside weather building	21 mr/hr	Waist level
Living area Still	60 mr/hr	Waist level
Inside barracks	23 mr/hr	Waist level
Inside dispensary	25 mr/hr	Waist level

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RONGERIK COLI'T

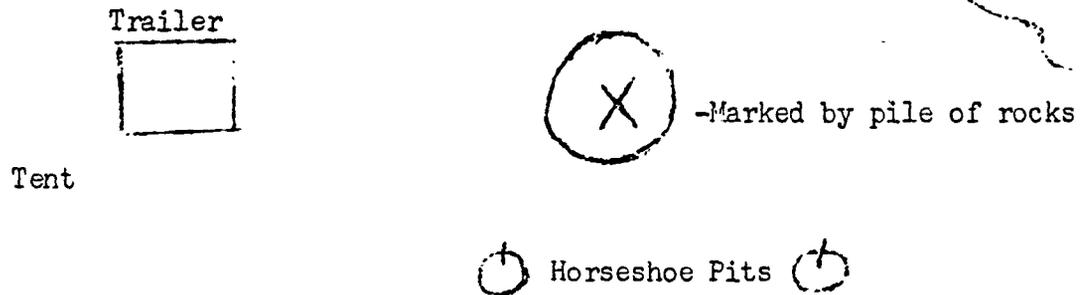
26 March, 1500 MIKE

<u>Army Site</u>	Out	42 mr/hr	Waist Level
	In	20 mr/hr	Waist Level
<u>Weather Site</u>	Out	40 mr/hr	Waist Level
	In	18 mr/hr	Waist Level
<u>Living Site</u>	Out	35 mr/hr	Waist Level
	In	15 mr/hr	Waist Level

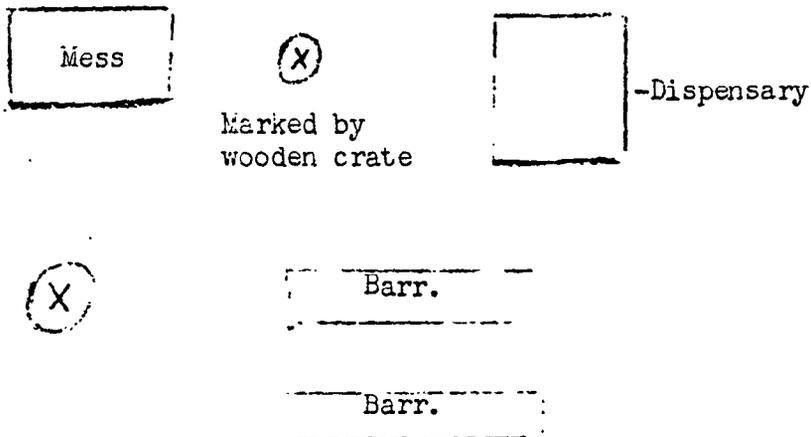
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ARMY AREA (Location of samples taken)

OCEAN

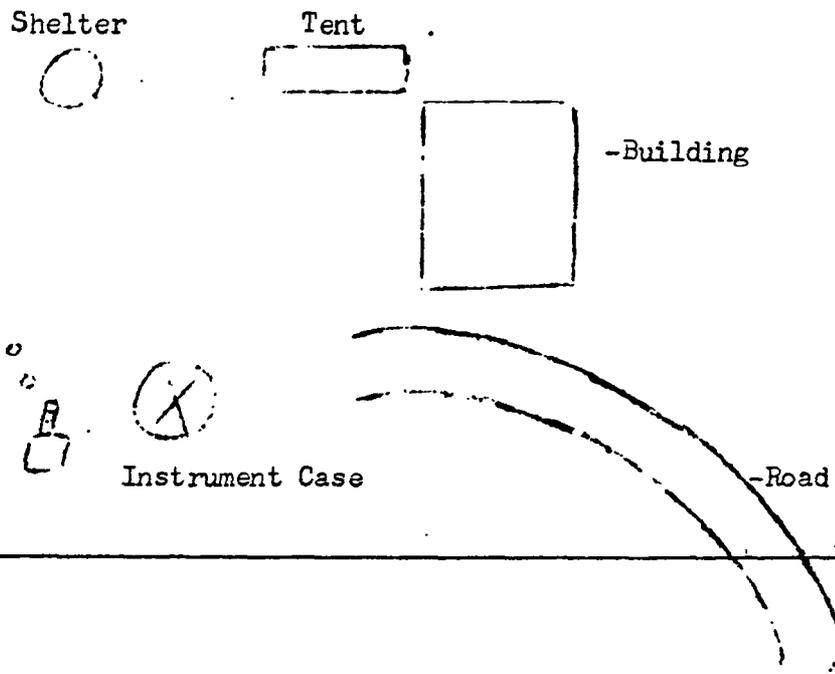


LIVING AREA (Location of samples taken)



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WEATHER SITE (Location of samples taken)



(s/t R. A. House  
R. A. HOUSE  
Lt Col., USAF  
Ch. Tech Br, J-3  
JTF SEVEN

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MEMORANDUM FOR RECORD:

SUBJECT: Kwajalein-NYOO Flight ABLE Results

1. NYOO-Kwajalein Flight Able, consists of an aerial survey at approximately 200 feet altitude over the following atolls north of Kwajalein: Lae, Ujae, Wotho, Bikini, Ailinginae, Rongelap, Rongerik, Taongi, Bikar, Utirik, Taka, Ailuk, Jemo and Likiep. The aircraft are equipped with scintimeters which are sensitive gamma radiation measuring instruments with a wide range, designed to measure ground contamination from altitudes of 200 to 500 feet.

2. Following ~~ROMEO~~ snot at 261825Z March 1954, Flight Able was flown on the following dates with results indicated: (In mr/hr ground contamination)

Island (Atoll)	<u>271900Z to 280317Z</u>	<u>302030Z to 310208Z</u>
Lae (Lae)	0	0
Ujae (Ujae)	0	0.2
Wotho (Wotho)	0	1.7
Enibuk (Ailinginae)	6	26
Rongelap (Rongelap)	28	78
Rongerik (Rongerik)	36	58
Sybilla (Taongi)	1.0	0.4
Bikar (Bikar)	0.1	15
Utirik (Utirik)	--	7
Taka (Taka)	8	7
Kapen (Ailuk)	1.6	2.4
Jemo (Jemo)	0.8	2.4
Likiep (Likiep)	0.4	1.0

(s/t) R. A. HOUSE  
Lt Col., USAF  
ChTechOps Br, J-3  
JTF SEVEN

INCLOSURE 7

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DRINKING WATER SAMPLES (Analysis Report)

<u>SAMPLE NO.</u>	<u>COLLECTION DATE</u>	<u>TIME</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>d/m/ml</u> <u>(ON SAMPLE DATE)</u>
W1	6 March	0800	Likiep Island Likiep Atoll	Collected from largest cistern on heaviest populated island of atoll	77
W2	6 March	1200	Jemo Island	Same as W1	550
W3	6 March	1700	Ailuk Island Ailuk Atoll	Same as W1	1020
W4	7 March	1300	Mejit Island	Same as W1	2500
W5-8	4 March	0900	Utirik Atoll	Composite of 4 water samples taken by USS RENSHAW	430
W11	5 March	1600	Ormed Island Wotje Atoll	Composite: $\frac{1}{2}$ from catch-basin	109
W12	6 March	1130	Kaven Island Maloelap atoll	1 from well	67
W13	6 March	1130	Kaven Island Maloelap Atoll	1 from catch-basin	31
W9	6 March	1630	Wotho Island Wotho Atoll	1 from well (catch-basin dry for 1 month plus)	7
W10	7 March	1200	Dalap Island Majuro Atoll	Tap Water	14
W11	3 March	0930	Rongelap Island	Composite of 6 bottles. Chart included to show location of bottles on Rongelap Island	94,000 120,000 47,000 No. 1 No. 6 24,000 11,000 63,000
W12	8 March		Rongelap Island	Central cistern of village	50,000*
W13	8 March		Rongelap Island	Cistern water from north part of island	73,000*
W14	8 March		Rongelap Island	Cistern water from northern most village	8,000*

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DRINKING WATER SAMPLES (Analysis Report) Cont'd

<u>SAMPLE NO.</u>	<u>COLLECTION DATE</u>	<u>TIME</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>d/m/ml (ON SAMPLE DATE)</u>
WL5	8 March		Rongelap Island	South cistern in village	60,000*
WL6	9 March		Utirik Island	Cistern	7,200*
WL7	9 March		Utirik Island	Cistern	33,000*
WL8	10 March		Eniwetak Island Rongerik Atoll	Distillation water	66*

\* computed as of 3 March

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SOIL SAMPLES (ANALYSIS REPORT)

SAMPLE NO.	COLLECTION		LOCATION	DESCRIPTION	d/m/gm
	DATE	TIME			(ON SAMPLE DATE)
S1	6 March	0800	Likiep Island Likiep Atoll	Upper layer bare soil in random spots un- sheltered by trees or shrubs etc.	23,000
S2	6 March	1200	Jemo Island	Same as above	13,000
S3	6 March	1700	Ailuk Island Ailuk Atoll	Same as above	23,000
S4	7 March	1300	Mejit Island	Same as above	30,000
S5	5 March	1600	Ormed Island Wotje Atoll	Composite of 5 samples (1 beach, 3 mid-village, 1 back village)	15,000
S6	5 March	1730	Erikub Island Erikub Atoll	Composite of 2 samples (1 mid-village, 1 half- way to beach)	4,300
S7	6 March	1130	Kaven Island Maloelap Atoll	Composite of 4 samples (2 from village, 2 from paths to beach)	5,500
S8	6 March	1630	Wotho Island Wotho Atoll	Composite of 3 samples (1 by well, 2 mid-village)	2,400
S9	7 March	1200	Dalap Island Majuro Atoll	Composite of 4 samples (near Admin Bldg)	950
S10	7 March	1200	Utirik Island	Composite of 3 samples (Collection date of S10 is uncertain, probably 3 March 1954 by PEM Survey Party. Analysis value given is corrected to 7 March.)	270,000
S11	8 March		Rongelap Island	Soil from north part of island	1,300,000**
S12	8 March		Rongelap Island	Center portion of island	7,400,000**
S13	8 March		Rongelap Island	1 mile north of Rongelap village	460,000**

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SOIL SAMPLES (ANALYSIS REPORT) CONT'D

<u>SAMPLE NO.</u>	<u>COLLECTION DATE</u>	<u>TIME</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>d/m/gm (ON SAMPLE DATE)</u>
S14	8 March		Rongelap Island	Near south cistern of village	630,000**
S15	8 March		Eriirippu Island Rongelap Atoll		35,000,000**
S16	8 March		Eniwetak Island Rongerik Atoll		3,200,000**
S17	8 March		Kabelle Island Rongelap Atoll		20,000,000**
S18	9 March		Utirik Island		5,600,000**
S19	9 March		Bikar Island		280,000**
S20	10 March		Eniwetak Island Rongerik Atoll		1,200,000**
S21	10 March		Sifo Island Ailinginae Atoll	Temporary village	84,000**
*S22	9 March		Bikar Island	Foliage, windward side	460,000**

\* d/m/gm of plant ash (Equiv. to  $1.4 \times 10^4$  d/m/gm plant as received)

\*\* Computed as of 3 March

Soil values may be roughly translated to curies per square mile by dividing by 13, or to d/m/ft<sup>2</sup> by multiplying by 6000.

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*Handwritten notes:* 12/1/54

Incl. 3. Close-in Forecasting by New Techniques Developed after BRAVO

122730

1. The method of calculating local fall-out, as described here, is the hasty outgrowth of a more complex method that had been unexpectedly successful in accounting for the BRAVO fall-out pattern in the Ailingnaa-Rongelap-Rongerik area. As the time of the last shot (on Eniwetok Atoll) approached, the problem of forecasting local fall-out became more acute. Since the method attempted to take account of the initial size and shape of the cloud, it seemed that it should be suitable for local forecasting. With the aid of Dr. Gaelen Felt, the method was simplified to the extent that an atoll pattern could be estimated within about an hour. The simplified method was tested against the Bikini patterns produced by ROMED, UNION and YANKEE and found satisfactory, and the method was used in forecasting for NECTAR.

2. The following description covers the simplified method only. The more complex method warrants further study which will be reported elsewhere.

3. Assumptions:

(a) The initial cloud (after rise is practically completed) is divided into horizontal slices, each of 10,000 ft depth, with centers at 10,000, 20,000, - - - - 70,000 ft altitude, with the central concentration (radioactivity per unit volume) independent of altitude.

(b) In each layer all of the activity lies in a horizontal plane thru the center.

(c) In each layer, the concentration falls off laterally according to the law of normal distribution of errors

$$c(r) = C_0 e^{-\frac{r^2}{a_0^2}}$$

where  $C_0$  is the initial central concentration,  $r$  is distance from center, and  $a_0$  is the initial spread parameter (analogous to standard deviation). For altitudes 10,000 thru 40,000 ft,  $a_0 = 1.9$  miles; 50,000 thru 70,000 ft,  $a_0 = 5.8$  miles.

(d) Thruout the whole cloud, all radioactive particles are of the same size, and fall at 50,000 ft per hour.

(e) In each layer, the central particle falls, without diffusion, as directed by the winds, while other particles diffuse horizontally away from the center equally in all directions so that, when the layer arrives on the surface, the distribution about the center is given by

$$c(r) = \frac{C_0}{p^2} e^{-\frac{(q)^2}{(p)^2}}$$

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Location: FAIR  
Collection: Records Center C-2 D-8  
Folder: Fallout Computers  
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where  $p = \frac{S_0 + S}{S_0}$ ,  $q = r/a_0$ ,  $S =$  total horizontal distance travelled by the central particle,  $S_0 = 5.2 a_0$ . (The last quantity may be pictured as the horizontal distance back to a fictitious point source of the cloud layer).

(f) The dose rate at any point is proportional to the sum of the concentrations from all of the layers as estimated from the preceding formula.

4. Apart from the assumption of a single particle size this formulation has a number of other obvious defects, e.g.

- a. The sum of the quantities  $C_0 a_0^2$  should be made proportional to the total radioactive yield of the "bomb." In practice, the final estimates were adjusted somewhat on account of expected yield. This, in effect, allowed for the influence on  $C_0$ , but not on  $a_0$ .
- b. The estimation of  $S$  as total horizontal distance is rather unsatisfactory in local forecasting where the atoll dimensions are not much greater than the height of the cloud.

Also, there was no time to find out whether better results could be obtained by choice of some other values for parameters such as rate of fall for the particles. From the test of the method against the Bikini patterns, it was clear that it was good enough for the purpose at hand. It appeared that differences between forecast and actual winds would be likely to produce much larger errors than those inherent in the assumptions.

5. In application, the method is not as tedious as might appear. The standard hodograph plot, giving the location of central particles falling at 5,000 ft per hour, is prepared for the Command Briefing as a matter of course. It can be superimposed on a ten times magnified atoll map, allowing for the 50,000 ft per hour fall rate assumed in the method. With a ruler of corresponding scale, the distances  $S$ , along the zig-zag path to each of the height points on the hodograph can be quickly measured or this can be done by summation of hodograph winds if these are more readily accessible. Likewise, the distances from the altitude points on the hodograph to points of fall-out interest can be quickly measured with the ruler, giving the values of  $r$ . Knowing  $S$  and  $r$ , one can easily compute  $p$  and  $q$ . With the aid of a family of curves of  $\frac{1}{p^2} e^{-\frac{q^2}{p^2}}$  vs  $q$

(see Fig. 1) for several values of  $p$ , one can rapidly interpolate the values that must be added up at any location. The exponential factor drops off very rapidly with  $q$ , and after working out a few cases, one can tell, from an inspection of the hodograph-on-atoll plot, some of the altitude points that can be neglected in the computation.

6. Fig. 2 and Table 1 illustrates the application of the method to NECTAR shot, using the winds observed at shot time. The points on Fig. 2 marked 10, 20, 30, are the 10,000 ft, 20,000 ft, - - - altitude points on the hodograph for particles falling 50,000 ft per hour. A particle starting, for example, at 30,000 ft above ground zero, and falling under the influence of winds but not diffusion, would land at the point marked 30. The value of  $S$ , the horizontal distance travelled, is estimated by summing the

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distances between the successive points from ground zero to point 30. In calculating  $\sigma$  in Table 1, some values are omitted as beyond the range of Fig. 1. More values are dropped, as too small to bother with, in entering the quantities  $\frac{1}{p^2} e^{-\frac{(q)^2}{(p)^2}}$ . The final totals are the surface

concentrations that would be produced if the initial central concentrations ( $C_0$ ) were all unity. When the method was tried out on YANKEE, it was found that if the resultant surface concentrations were multiplied by 100, they agree reasonably well with the dose rate, in roentgens per hour, measured one day after the shot. This factor was used in making up Table 2, and it appears to give fairly good results for BRAVO, ROMEO, and UNION also, although there is some tendency to over-estimate the lower dose rates at the larger distances. In Table 1, however, it is clear that the agreement is about as good as in Table 2 without multiplying by a factor of 100. The yield of NECTAR was less than that of the shots in Table 2, but not by a factor of 100. At the present time the only explanation that can be offered for this discrepancy is the heavy rain that occurred on NECTAR day.

7. There is good reason to anticipate that the current detailed study of the more complex method will yield a better simplified technique than the above. For this reason, there is little justification for a more elaborate report on the method at this time.

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TABLE 1

HEIGHT (1000 FT.)	a <sub>0</sub> (MI)	S <sub>0</sub> (5.2 a <sub>0</sub> )	S (MI)	P $\frac{(S_0+S)}{S_0}$	q = r/a <sub>0</sub>			
					ALICE	JANET	SALLY	ELMER
70	5.8	30	29	2.0	1.6	1.4	2.3	4.4
60	5.8	30	23	1.8	2.2	1.5	1.7	4.1
50	5.8	30	19	1.6	2.1	1.3	2.1	4.5
40	1.9	10	12	2.2	4.5	4.7	--	--
30	1.9	10	9	1.9	3.1	4.2	6.3	--
20	1.9	10	6	1.6	2.4	4.4	--	--
10	1.9	10	3	1.3	1.2	3.0	5.6	--

$$\frac{1}{p^2} e^{-\frac{(q)^2}{(p)^2}}$$

HEIGHT	p	ALICE	JANET	SALLY	ELMER
70	2.0	.14	.16	.07	.0020
60	1.8	.07	.15	.12	.0020
50	1.6	.07	.20	.07	--
40	2.2	--	--	--	--
30	1.9	.02	--	--	--
20	1.6	.04	--	--	--
10	1.3	.23	--	--	--
	TOTAL	.57	.51	.26	.002

OBSERVED  
R/HR at N+1 DAY      .70      .18      .027      .000

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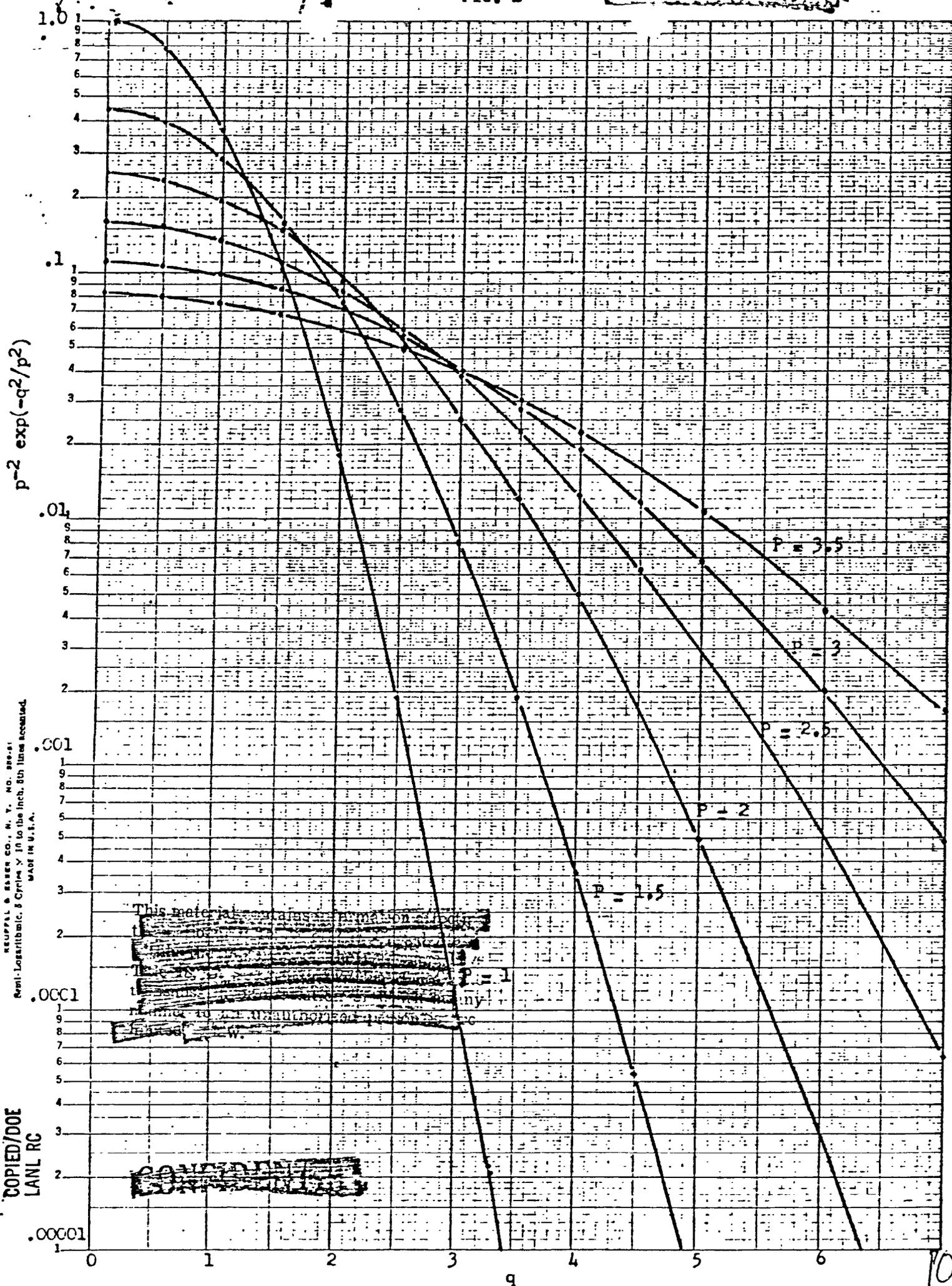
TABLE 2  
BIKINI R/HR AT D + 1 DAY

ISLAND	BRAVO		ROMEO		UNION		YANKEE	
	OBS	CALC	OBS	CALC	OBS	CALC	OBS	CALC
HOW	24	22	0	0.6	8.5	9	25	30
NAN	9	5	0	0.6	0.09	2	2	7
OBOE			0	0.6	0	0.7	0.04	3
UNCLE	1.0	0.9					0	5
BRAVO	1.0	0.6					0.5	0.3
ABLE			50	70			2	5
FOX	55	47			12	45		

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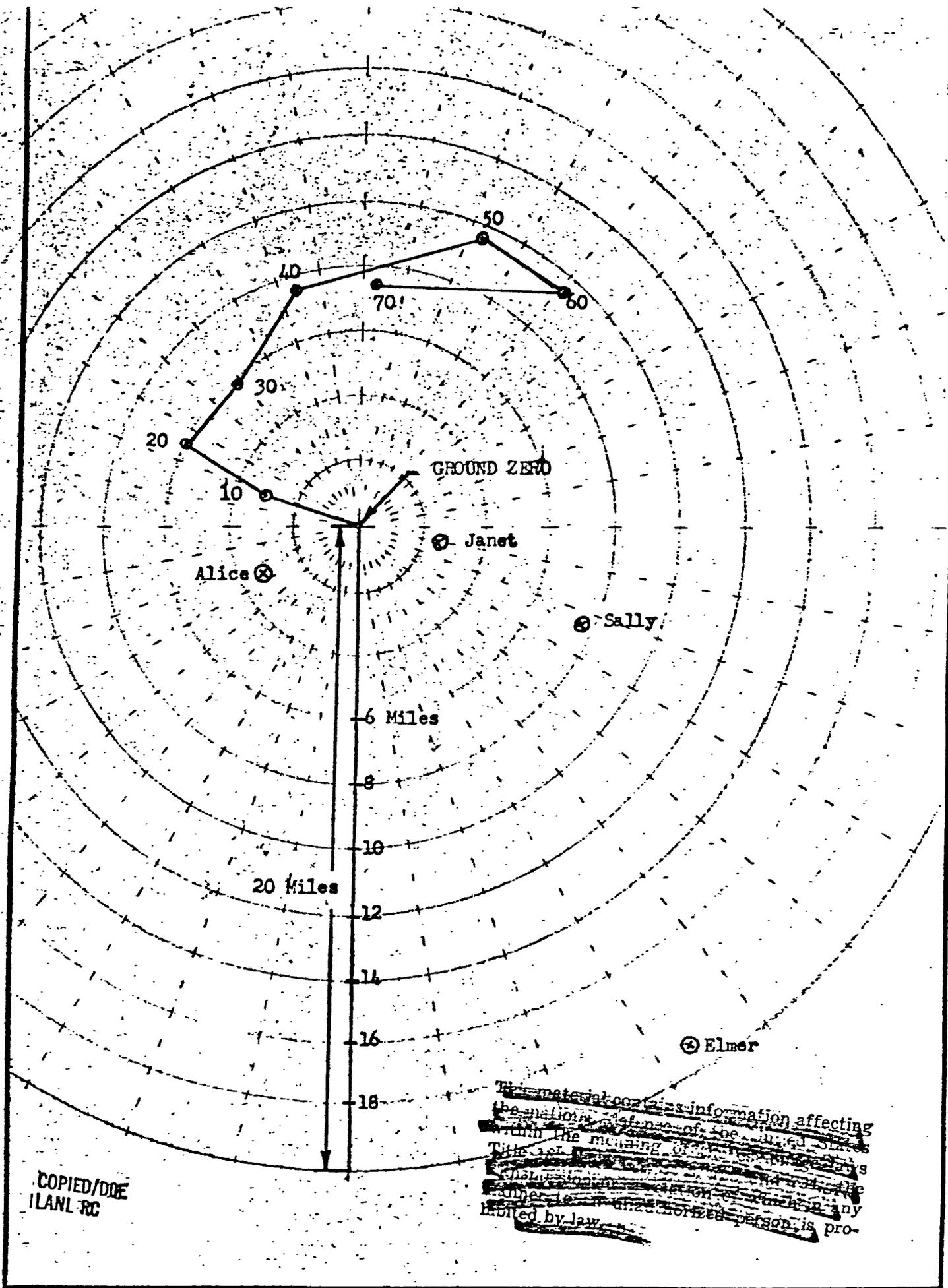
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FIG. 1



REUPAL & BAKER CO., N. Y. NO. 898-51  
 Semi-Logarithmic, 5 Cycles X 1/2 to the Inch, 5th Lines Accented.  
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